SMOKE MONITORING

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1st Annual Smoke Management Meeting for Arizona

March 14-15, 2005

Phoenix

OUTLINE

- WHY?
- HOW?
- RESULTS

WHY?

- STANDARDS & GUIDELINES
- NUISANCE CONFIRMATION
- NUMERICAL HACK ON THE “DENSITY & DURATION OF A SMOKE PLUME”

STANDARDS

- FEDERAL HEALTH STANDARDS
- TOTALLY INADEQUATE FOR ALMOST ALL FIRES
- BASED ON 24-HOUR AVERAGES OF PM (PARTICULATES)
- ONLY THE LARGEST OF WILDFIRES PRODUCE SMOKE THAT WOULD EXCEED THESE STANDARDS.

GUIDELINES

- Western States Air Resources Council

Stage	Duration (Hours)	PM10 (ug/m3)	PM2.5 (ug/m3)
Alert	4	>100	>85
Warning	4	>150	>130
Emergency	1	>400	>340

GUIDELINES

- MISSOULA HEALTH DEPARTMENT

CATEGORY	vis(mi)	PM-1hr
GOOD	>10	20
MODERATE	6-9	60
UNHEALTHY (SENSITIVE)	3-5	130
UNHEALTHY	1.5-2.5	250
VERY UNHEALTHY	1-1.25	400
HAZARDOUS	<.75	>500

HOW TO MEASURE

- Filter-based sampling doesn’t work
- Sampling times too long, laboratory weighing necessary
- Continuous samplers are needed, and, in the last few years, have become commercially available

NATURE OF INSTRUMENT

- PORTABLE
- BATTERY AND LINE CURRENT
- PM10 OR PM2.5 SAMPLING HEADS
- DATA TRANSMITTAL VIA SATELLITE
- OK AT AMBIENT TEMPERATURES
- NOT NECESSARILY EPA REFERENCE METHOD

EXAMPLES

- DATARAM
- E-BAM
- E-SAMPLER
- DUSTTRACK

INFORMATION

- INTERAGENCY REAL TIME SMOKE MONITORING
- (USFS, BLM, USFWS)
- http://www.satguard.com/usfs4/systems.asp

SAMPLE PLANNING - 1

- SELECT A SITE:
- NEAR SENSITIVE POPULATION,
- NEAR A HIGHWAY,
- OR NEAR A WILDERNESS AREA

SAMPLE PLANNING - 2

- IF REAL-TIME DATA REVIEW, THEN
- COVER ALL ASPECTS OF TELEMETRY AND TEST BEFORE BURN
- IF NOT, THEN LIFE IS EASIER
- RUN FOR A DAY BEFORE AND AFTER THE BURN FOR “BACKGROUND”
- RETRIEVE DATA
- ANALYZE

DATA ANALYSIS

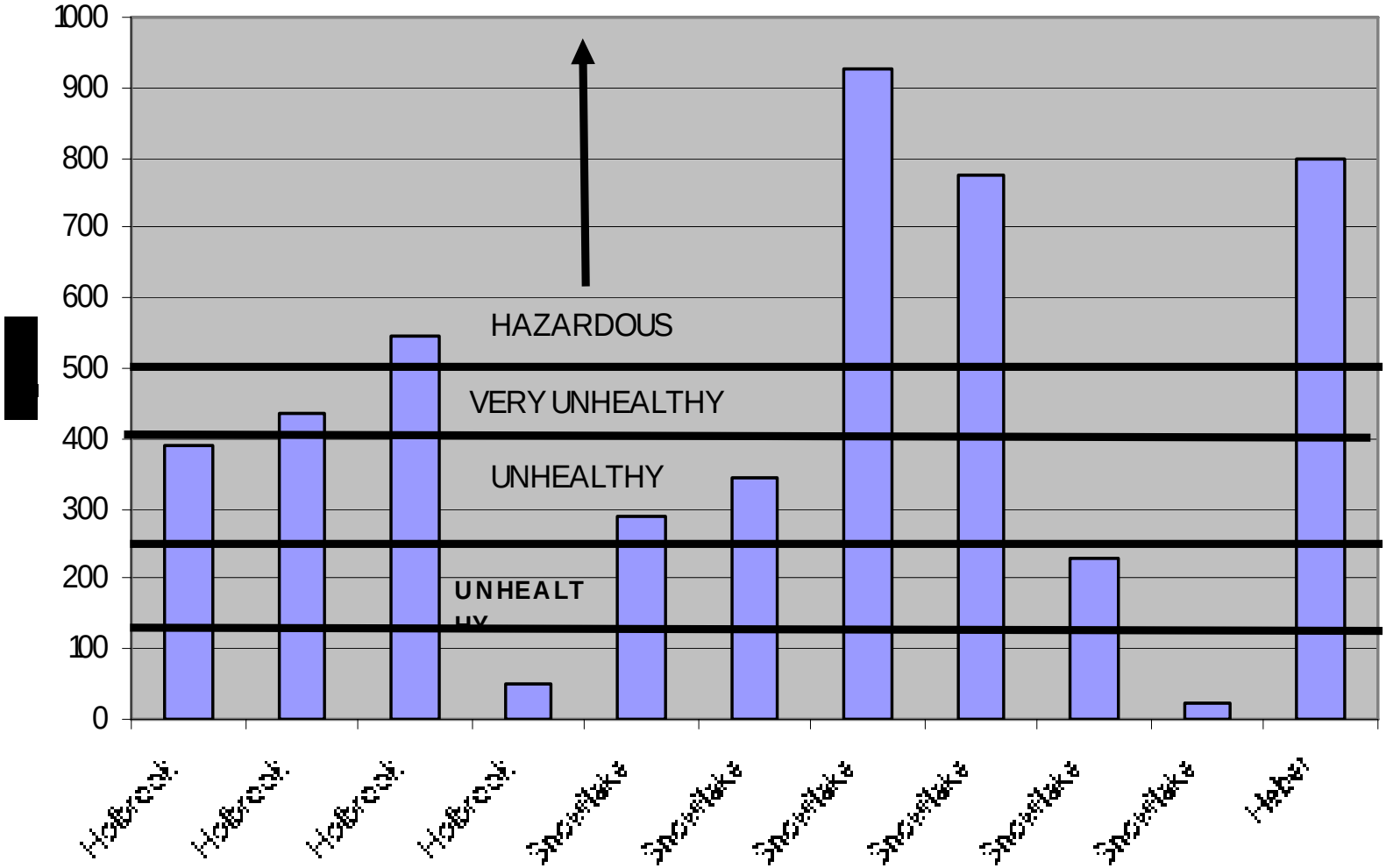
- COMPARE WITH GUIDELINES
- LOOK AT WIND SPEEDS & DIRECTIONS TO INFER TRANSPORT
- COMPARE CONCENTRATIONS WITH OTHER BURNS

RESULTS

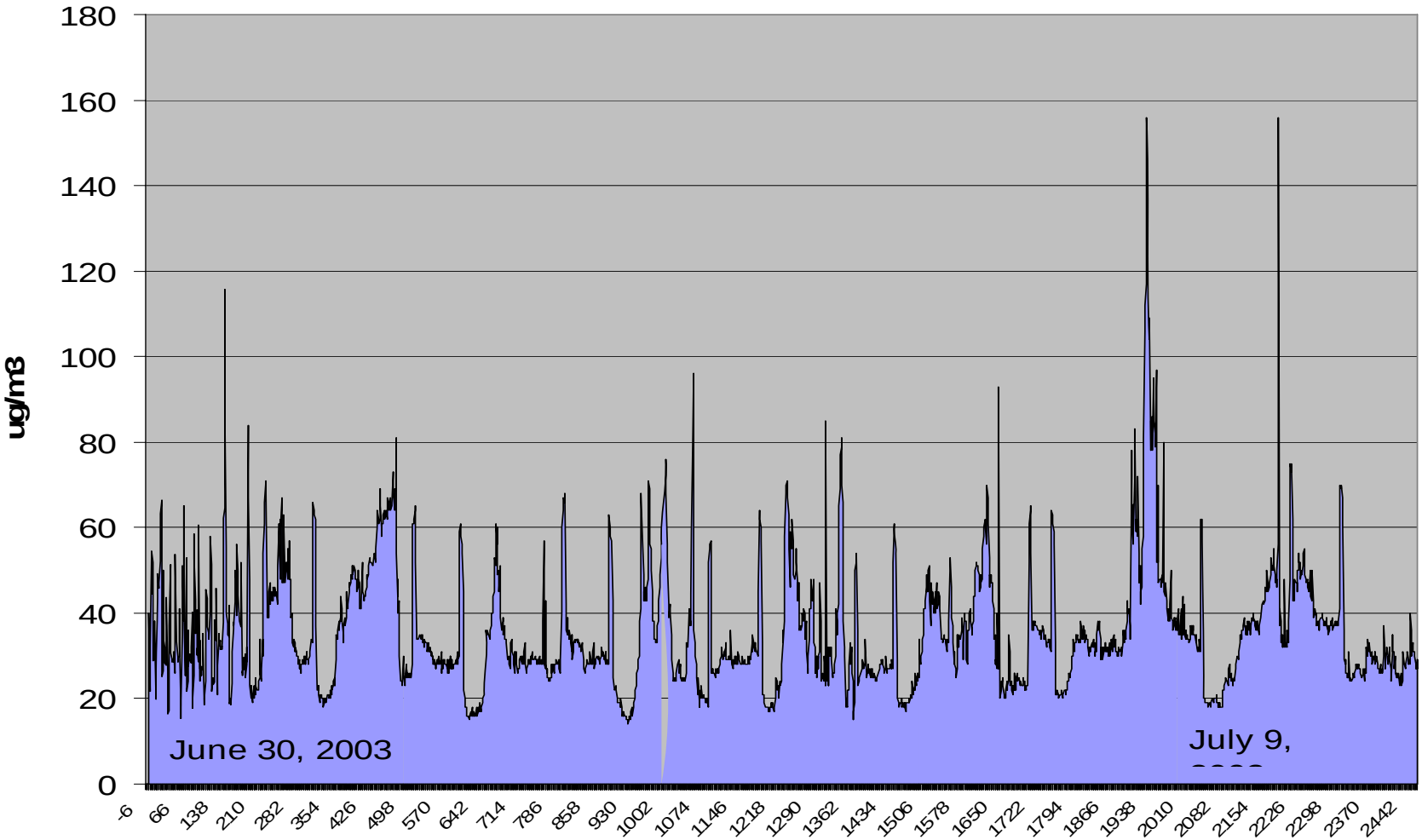
- FROM ARIZONA WILDFIRES
- FOREST SERVICE & ADEQ PERSONNEL
- DATARAMS AND DUSTTRACKS

FIRE	DATES	LOCATION
Rodeo-Chediski	June-July 2002	ShowLow, etc
Aspen	June 2003	Mt. Lemon Tucson
Willow	July 2004	Payson

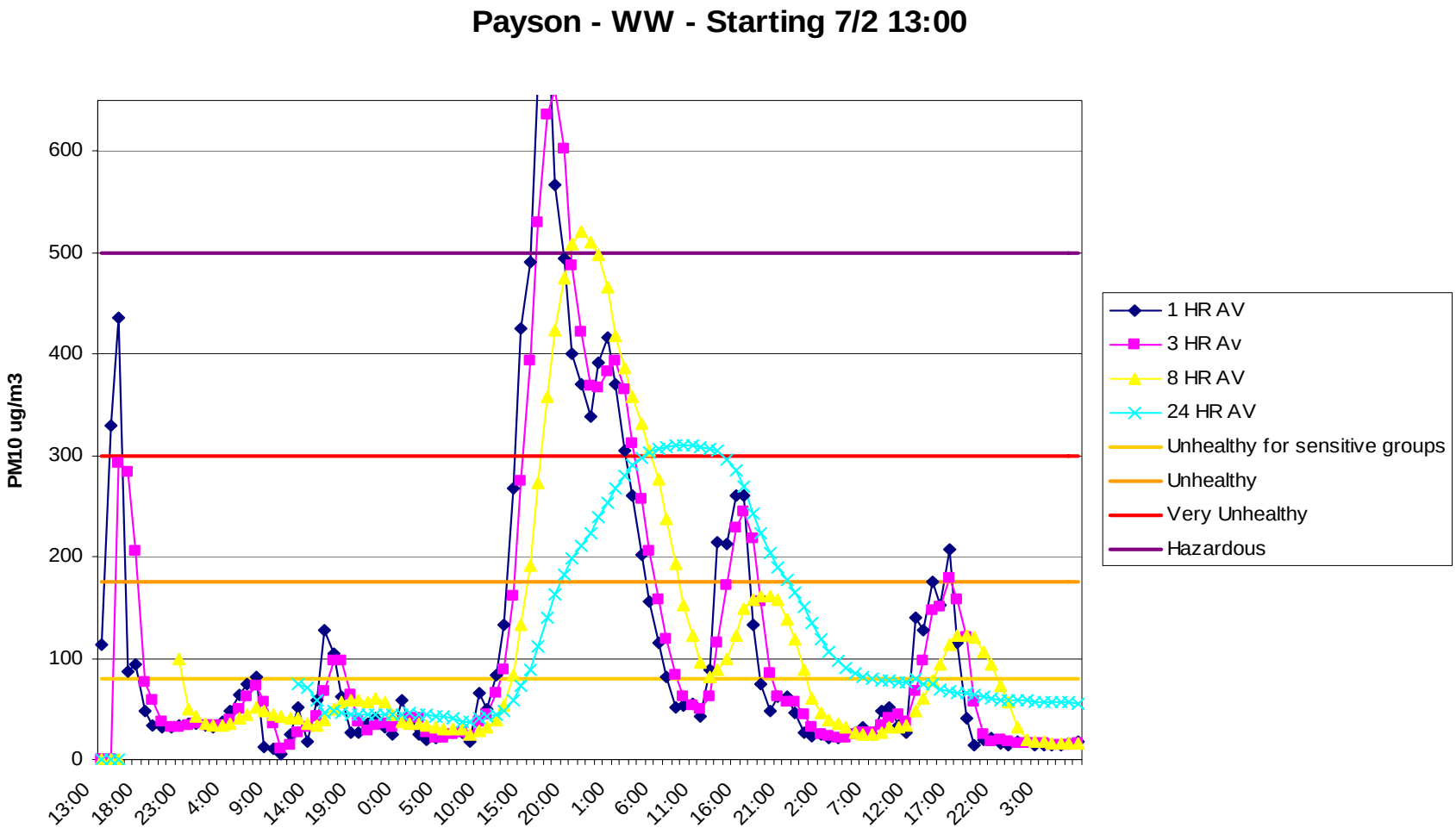
PM10 Concentrations from Holbrook, Snowflake, and Heber: Rodeo-Chediski Fire: Maximum 1-hr Values



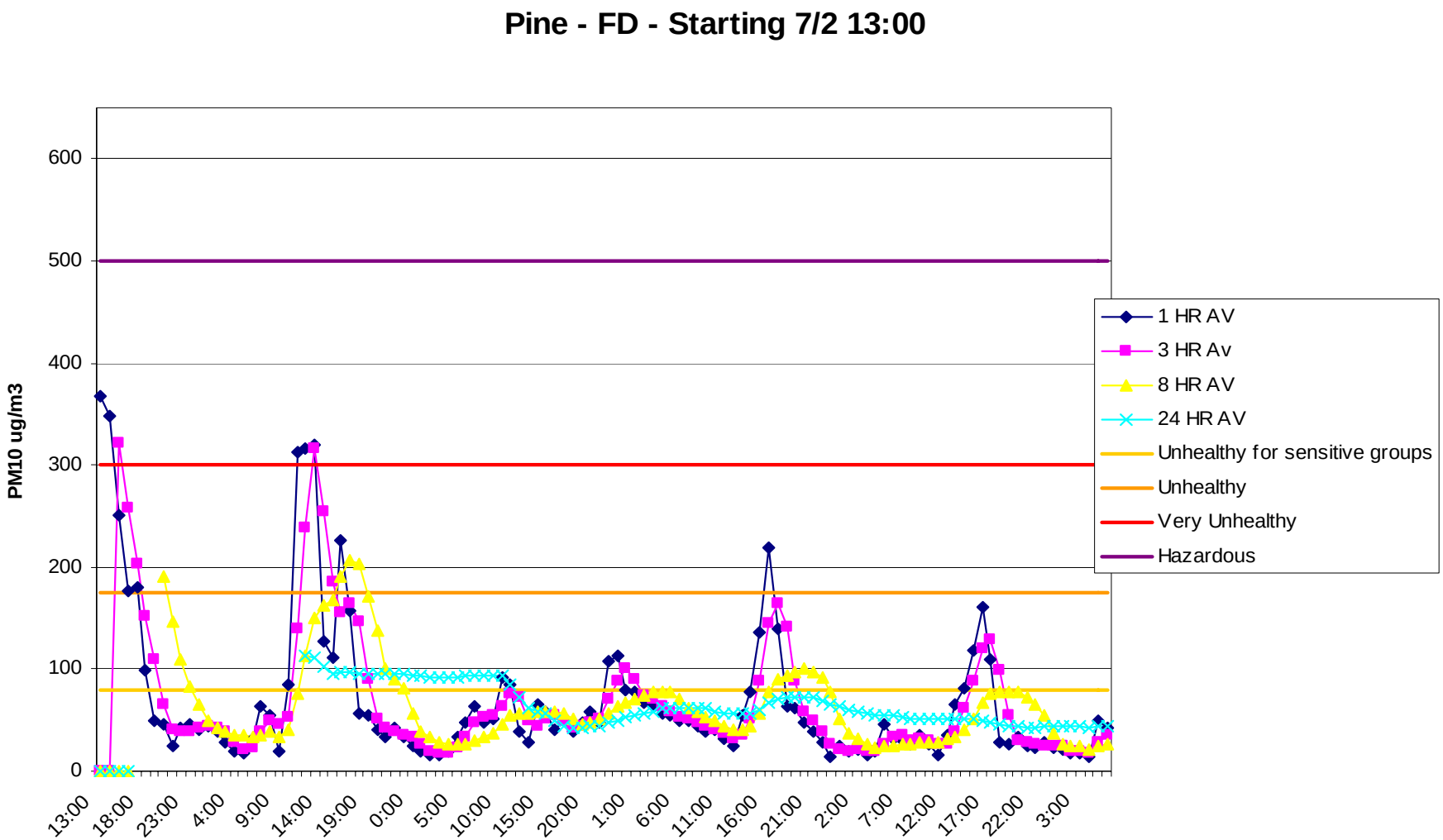
PM10 Concentrations at Catalina State Park, during the Aspen Fire on Mt. Lemon: June – July, 2003



PM10 Concentrations at Payson: Various Averages (1,3,8,& 24 hr): Willow Fire, July 2004



PM10 Concentrations at Pine: Various Averages (1,3,8,& 24 hr): Willow Fire, July 2004



Concluding Remarks-1

- Technology is available to monitor smoke from prescribed fires.
- Reasons to monitor include:

1. To better understand impacts, in a quantitative way
2. To counter chronic complainer claims
3. To better manage a series of burns near a sensitive population

Concluding Remarks-2

- ADEQ has staff, instruments, and interest
- We would be happy to participate in some field trials and would provide insights and training as desired.
- Thank you for your attention at the end of this second half-day of meeting.